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CASE REPORT

Comprehensive dental treatment for "meth mouth": A case report and literature review

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Methamphetamine-induced caries (MIC) is the rampant caries often found in methamphetamine (MA) users and is often called "meth mouth". It leads to devastating effects on dentition and is the major reason that brings patients to professional help. Dental management of these patients is challenging and the most important factor is cessation of MA use. Dentists must be aware of the signs and medical risks associated with this serious condition. If duly attended to, the dental team can help patients on many levels. Treatment plans can be simplified, so that each visit does not last too long. Finally, more attention should be paid topostoperative care. This case report presents a 40-year-old man with rampant caries caused by MA abuse with poor oral hygiene and smoking habits. He was advised to stop the drug abuse and the affected teeth underwent endodontic, restorative and prosthetic rehabilitation. One year later, the patient had some secondary caries but had stopped all drug abuse.

Introduction

Methamphetamine (MA) is a highly addictive stimulant of the central nervous system. It increases physical activity and produces intense euphoria by altering the processing of several neurotransmitters, such as norepinephrine and dopamine. Side effects of MA abuse include increased respiration, an irregular heartbeat, brain damage, anxiety, hallucinations, convulsions, paranoia and aggressiveness.[1]

MA has rapidly established itself as a leading drug of abuse because it is easy and relatively inexpensive to manufacture but produces prolonged euphoria for users. The 2009 World Drug Report estimated that up to 51 million individuals worldwide have used MA at least once in the past 12 months.[2]

The dental symptoms of MA users are poor oral hygiene, gingival inflammation, xerostomia, rampant caries and excessive tooth wear.[3] The term methamphetamine-induced caries (MIC) has been used to describe the rampant caries often found in MA users, which is also called

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"meth mouth".[4] The pattern of caries is distinctive in that, initially, it tends to start near the gums and involves the buccal smooth surface of the posterior teeth and the interproximal space of the anterior teeth, progressing to complete destruction of the coronal portion of the tooth.[5] The etiology may be the stimulation of inhibitory alpha-2 receptors by MA, resulting in reduction of salivary flow.[6,7] Instead of drinking water, MA users continually consume plenty of soft drinks.[8] Other contributing factors include poor oral hygiene, tooth grinding, and clenching.[9,10] The teeth are usually in such disrepair that extraction is the end result.[5] However, rare cases of successful dental treatment for these patients can be found.[11]

The following case report describes the dental treatment and successful drug abuse intervention in a patient with MIC caused by MA abuse with poor oral hygiene and smoking habits. A review of the literature regarding the dental treatment is also presented. Literature was searched using: (1) Medline (1966 to March 2011) and PubMed (1966 to March 2011) and (2) the World Wide Web, to identify relevant references published in English. Identified articles were searched manually. Key words included methamphetamine, meth mouth, drug abuse, dental caries and dentistry.

Case report

A 40-year-old man presented to our hospital with a chief complaint of badly decayed teeth and poor aesthetics. Intra-oral examination and panoramic radiography revealed 24 residual roots, four residual crowns, and only one pulp cavity was not exposed. The erosive carious lesions extending to the gums were leathery and brown (Fig. 1). The patient reported no pain on cold testing and percussion, but pain when probed into the pulp cavity. Periodontal examination revealed supragingival dental plaque and calculus deposits with bleeding on probing, but no bone loss was found, which led to a diagnosis of gingivitis (Fig. 2).

The oral mucosa appeared slightly dry, but healthy, with clear saliva flowing from major duct orifices. Although the patient reported no temporomandibular joint (TMJ) or myofacial pain, clicking of the joint had been observed. He denied any history of allergies, family history of dental problems, and gastroesophageal reflux, among others. No abnormalities were found on routine blood examination and blood glucose determination. Serologic tests for human immunodeficiency virus, hepatitis B virus, and syphilis were all negative.

Figure 1 Frontal intra-oral view of the patient showing 24 residual roots, four residual crowns with leathery and rampant brown carious lesions extending to the gums. Dental plaque and inflamed soft tissue can also be seen.

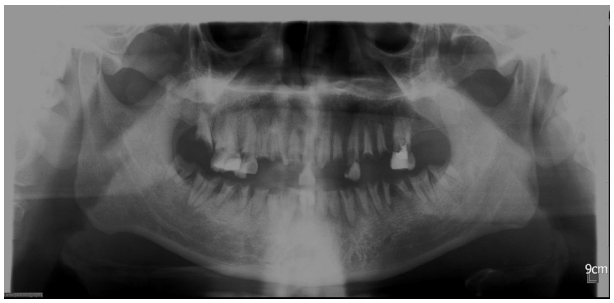

Figure 2 Preoperative panoramic radiograph showing that most of the teeth are residual roots and almost all pulp cavities are exposed. Perforations of the pulp floor can be seen in some molars.

After careful inquiry, the patient reported a 4-year history of Yaba abuse through inhalation. Yaba is the Thai name for brightly colored MA tablets.[4] He abused MA every 2—3 days, with random doses ranging from two to 20 tablets each time. While the patient was abusing MA, he consumed 1—1.5 L of carbohydrate-rich beverages daily to relieve the dryness and bitter taste in his mouth. He also noted occasional periods of clenching and TMJ discomfort on waking. The patient had smoked two packs of cigarettes per day for 20 years, which increased to six packs per day during the time of MA abuse. He admitted that he would go for days or weeks without brushing his teeth because of his change of lifestyle, but there were also times when he would brush regularly. He had not experienced any major dental caries before MA abuse and believed that the abuse was responsible for his dental problems.

The patient's medical history, along with the radiographic and intra-oral findings led to a diagnosis of MIC caused by MA abuse with poor oral hygiene and smoking habits. The key importance of rehabilitation and proper oral hygiene was emphasized to the patient and his relatives. As the patient was eager for aesthetic reconstruction of his dental appearance, he agreed to abstain from MA abuse and was encouraged to seek professional help. A signed consent form was obtained, in which he acknowledged an understanding of the ill effects of future MA use on restorative dental procedures. The patient refused extraction of his teeth for fear of changes to his facial structure as a result of alveolar bone absorption. After full consultation with the patient and his relatives, a treatment plan was established as follows:

1. Periodontal therapy.
2. Composite restoration of tooth number 15; porcelain crowns for teeth 16, 11, 23 and 26 after completion of endodontic treatment and postcores.
3. Teeth 17, 36, 37, 46 and 47 were extracted because of perforations of the pulp floor and polyps. The patient

underwent root canal treatment for the remaining residual roots. Placement of overdenture followed all the treatments and soft tissue healing.
4. A home care regimen including brushing with fluoridated toothpaste three times a day while avoiding soft drinks. In addition, rinsing with an over-the-counter mouthwash containing chlorhexidine was recommended.

However, during the therapeutic procedure, the crowns of teeth 23 and 26 fractured; the crown of number 11 was removed for aesthetic considerations. Endodontic treatment was finished in 1 month with good compliance (Figs. 3 and 4). Two months later, the overdentures were placed, and the patient was pleased with the aesthetic and functional results of his dentures (Figs. 5 and 6).

During the treatment, the patient was so anxious about the effectiveness of the local analgesia that he would sometimes even ask to stop the treatment to have a cigarette. Therefore, short visits were arranged and for all treatments he was accompanied by family members at doctors' request.

In the following 1 year, the patient had three recall visits, at each of which he received fluoride varnish applications. One year later, five fillings fell out as a result of secondary caries (Fig. 7). These five teeth gave no pain on percussion. Radiography showed that the root canal filling material was dense without apparent radiolucency. So, these teeth were refilled with composite resin without endodontic retreatment. The patient stated that he no longer used recreational drugs and his tobacco consumption was reduced to two packs per day, which was confirmed by his relatives.

Discussion

Although there are some case reports of meth mouth in the literature,[7,10–13] cases of successful dental treatment are rare. Morales[14] reported a case of dental treatment of meth mouth in a 22-year-old man who had successfully gone through a drug intervention program 2 years earlier.

Figure 3 Frontal intra-oral view at the completion of endodontic treatment, showing that the residual roots and crowns have been filled with composite resin, cervical calculus removed and soft tissue inflammation eliminated.

Figure 4 Postoperative panoramic radiograph. Note that all the root canal fillings are dense and of appropriate length, and there is no large radiolucency in the apical areas of the teeth.

The key to successful dental treatment is cessation of MA use.[15] Moreover, the financial difficulties and psychosis that result from chronic MA abuse, and prolonged neglect of oral health, make it difficult to complete the dental treatment and leave teeth extraction as the only treatment modality.[16] Dentists should first comprehensively evaluate to what extent the patient can actively participate in the dental treatment. In general, the treatment plans made for addicted patients are less elaborate than those for nonaddicts; fillings or frames instead of crowns or bridges have been proposed.[17] The key in this case was that the patient was eager to start a new life with the support of his family.

Thorough review of medical history

Several studies have concluded that drug-addicted dental patients are less than eager to declare their abuse of drugs because of the fear of being ostracized or legally prosecuted.[18] However, obtaining a history of drug abuse was not difficult in this case. Aside from the patient's willingness to reconstruct his dental appearance, the reason proposed was that most MA users are conscious of their dental problems, some even know the link between MA abuse and oral health problems.[13,19]

Dentists should express concern for the unusual damage and highlight that obtaining a thorough medical history is essential to ensuring the safety and efficacy of dental therapies.[20] Conversations could begin with, "How did your

Figure 5 Occlusal view of the overdentures showing that the relationship between upper and lower teeth is appropriate.

Figure 6 Frontal view of the post-prosthetic smile showing that the patient was satisfied with the aesthetic and functional results.

teeth get to be this way? Normally, we don't see this kind of decay and/or tooth damage very often. It usually happens if someone drinks excessive amounts of sugary soda or takes drugs." It is advised that doctors should present the facts rather than assign blame and stop immediately if the patient becomes agitated or paranoid.

Given that MA users are at great risk of cardio-cerebrovascular events and transmitting blood-borne diseases, dentists should be aware of the signs of MA abuse.[7] Distinctive patterns of unexplained rampant caries, accelerated tooth wear from bruxism, reports of xerostomia, and abundant dental plaque, especially among teenagers and young adults, are among the signs of meth mouth.[16] Tell-tale cutaneous lesions on the arms and the wearing of long-sleeved shirts during summer often indicate parenteral MA abuse. Patients who frequently miss appointments without good reasons or exhibit mood swings, violent outbursts, paranoid behavior, or have malnourished appearance may be MA abusers and should be fastidiously considered.

Dental treatment for MA users

If drug use is confirmed, a thorough medical/dental history and complete examination must be performed. All dental

Figure 7 Frontal intra-oral view of 1-year follow-up. Note that five fillings fell out as a result of secondary caries. However, the rampant caries has been controlled.

treatment should be postponed within 24 hours of the last drug usage.[21] Intravenous sedation with a benzodiazepine or general sedation should be avoided. Pain control of patients high on MA can be accomplished through local anesthetics without epinephrine and adequate post-operative doses of acetaminophen or ibuprofen.[15] For the patients free from MA, local anesthetic with vasoconstrictor is not contraindicated. Nonsteroidal anti-inflammatory agents can be routinely used.[22]

Preventive treatments and postoperative care are important and were given the most attention in this case. A signed consent form, wherein the patient acknowledges an understanding of the ill effects of future MA use on restorative dental procedures, should be obtained.[14] Discussing the situation with family members to encourage MA users to seek professional help may be the best course of action.[15] Patients should be counseled to drink eight to ten glasses of water daily while avoiding soft drinks. Depending on the degree of xerostomia, salivary substitutes, sugarless gums, pilocarpine HCl, or cevimeline HCl can be used.[23] The importance of proper oral hygiene needs to be emphasized, and basic oral hygiene skills have to be reviewed. Other preventive measures include fluoride supplementation and chlorhexidine applications.

Dentists can help MA abusers to recover

Management of MA addiction is a complicated procedure and beyond the responsibility of dental professionals, but the dental team may help these individuals on many levels. First, unlike the psychiatric and neurological symptoms of MA abuse, which tend to be transient, dental disease may provide a stable and specific marker for MA users. Dental professionals are in a unique position to help in the early detection and intervention of undisclosed MA use.[24] Second, oral hygiene and dietary counseling can change the lifestyle of patients and attract the attention of their relatives, which can help them refrain from MA. Third, the majority of patients are concerned about the cosmetic aspects of their dental disease,[19] which may provide a stimulus for engaging in stepped, motivational, dental clinic-based interventions patterned after similar tobacco-use cessation programs.[25] In the end, once the patient successfully completes a drug rehabilitation program, functional and aesthetic dental reconstruction is beneficial to improve their self-esteem and help them return to normal life.[14]

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